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Candle Fires in Residential Structures

FINDINGS

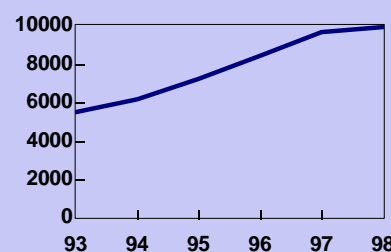
- The explosive growth of the candle industry parallels the annual increase of candle fires—a 3-year average of 10,000 fires, \$120 million in losses, 85 deaths, and 1,000 injuries.
- Women are more likely to be injured or die in candle fires than men.
- Injuries from candle fires are 2.25 times higher than from the average of all residential fires.
- One-quarter of candle fires occurs during the holiday season (December and January). During this period, holiday decorations are the materials first ignited.
- 44% of candle fires originate in the bedroom; 34% of these fires are due to unattended candles or candles placed too close to combustibles.

Retail sales of candles are growing each year. The National Candle Association estimates that sales exceeded \$2.3 billion in 2000. Nearly 2,000 varieties of candles are on the market, ranging from those used for religious purposes to those used for holiday decorations.¹

Candles are responsible for approximately 10,000 residential structure fires each year and cause 1,000 civilian injuries, 85 fatalities, and \$120 million in direct property loss.² This paper examines the causes and characteristics of these candle fires.

The incidence of fires directly attributable to candles in residential structures has increased since 1993 (Figure 1). Simultaneously, the candle industry has experienced a growth rate of 10 to 15 percent annually since the early 1990s. In recent years, this growth has doubled.³

**Figure 1. Incidence of
Candle Fires (1993-98)**



Fires caused directly by candles result in considerably more injuries and slightly more deaths and property loss than the average of all residential fires (Figure 2). When compared to other fires from consumer products that involve open flame (matches and lighters) or from heat (cigarettes and portable heaters), candle fires are less destructive than lighter and portable heater fires, but more destructive than cigarette and

Figure 2. Loss Measures for Residential Open Flame Fires
(3-year average, 1996-98 NFIRS data)

MEASURE	ALL RESIDENTIAL FIRES	RESIDENTIAL CANDLE FIRES	RESIDENTIAL MATCH FIRES	RESIDENTIAL LIGHTER FIRES	RESIDENTIAL CIGARETTE FIRES	PORTABLE HEATING FIRES
Loss per Fire	\$11,271	\$12,598	\$9,856	\$13,324	\$6,665	\$16,791
Injuries/1,000 Fires	48.0	107.9	64.0	128.3	97.4	92.0
Fatalities/1,000 Fires	7.7	8.0	6.1	11.8	23.7	27.2

match fires. Fatalities may be fewer than lighter, cigarette, and portable heating fires because many candle fires begin when the residence is unoccupied at the time of ignition.

According to an industry estimate, nearly 96 percent of candle buyers are women.⁴ This may explain why women are slightly more likely to be injured and are 13 percent more likely to die in residential candle fires than men.⁵

The sale and use of candles increase substantially during the holiday season (November through January). As would be expected, the incidence of residential candle fires corresponds to this time period. In fact, 25 percent of all candle fires occurs in December and January (Figure 3).

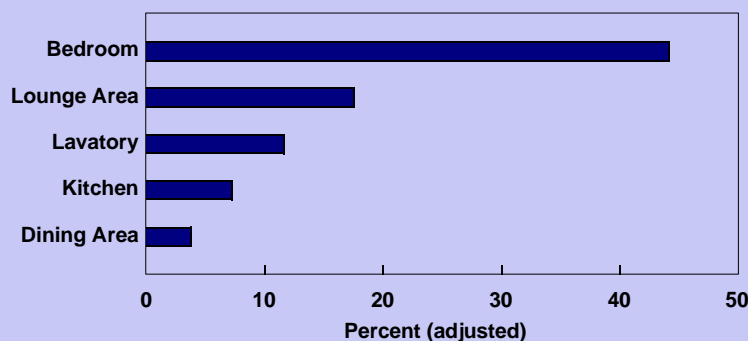
The leading materials first ignited by candles are cabinetry, mattresses, curtains, and furniture. In

December, however, holiday decorations are the leading materials first ignited.

Overall, the most common area of fire origin is in the bedroom, where nearly 45 percent of fires start (Figure 4). During the winter

months (and the holiday season), however, a higher percentage of candle fires originate in a dining area, although the bedroom remains the leading area of origin. More than 75 percent of residential candle fires are confined to the object or room of origin.

Figure 4. Area of Fire Origin in Residential Candle Fires
(3-year average, 1996-98 NFIRS data)



Unattended candles or candles placed too close to combustibles account for 34 percent of candle fires (Figure 5). Data from the

National Fire Incident Report System (NFIRS) indicate that the majority of candle fires result from human error and negligence. This underscores the importance of ensuring that candles are safely positioned and that they should never be left unattended.

The Consumer Product Safety Commission has issued 30 recalls of nearly 5.4 million

candles or candleholders since 1993.⁷ These recalls have been because the candle flame burns several inches above the candle or candleholder, which themselves are flammable.

Recent example of fires caused by candles include:

- During a power outage in 1999, a family lit a candle and placed it on an end table next to a couch. One of the residents fell asleep on the couch; the candle burned through the table and ignited his hair. He suffered only minor burn injuries, but the ensuing fire killed his 9-year old niece and severely burned his mother.⁸

Figure 3. Monthly Incidence of Residential Candle Fires
(3-year average, 1996-98 NFIRS data)

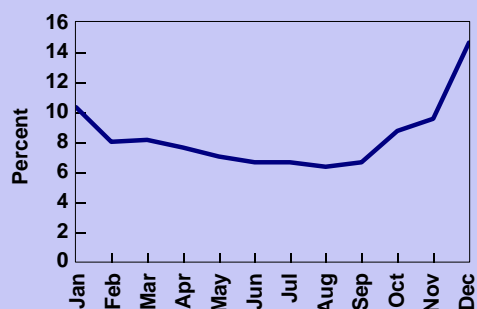
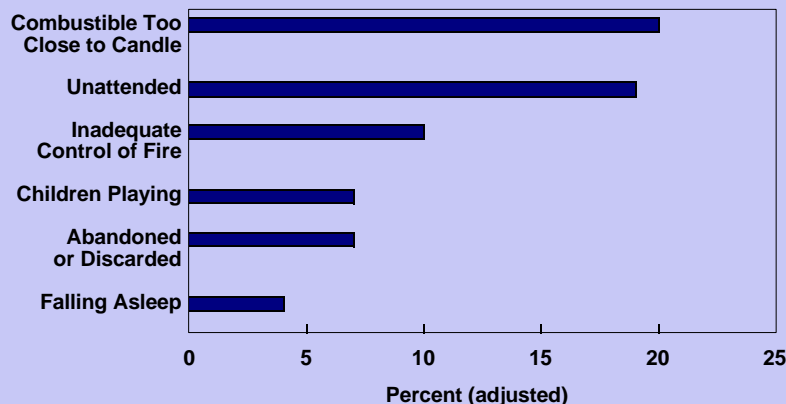


Figure 5. Leading Ignition Factors in Residential Candle Fires

(3-year average, 1996–98 NFIRS data)



- Two children were killed and their parents critically injured in December 2000 by a fire that was ignited when a candle accidentally rolled un the family's Christmas tree.⁹

- In June 2000, a young woman and her 5-month old daughter were killed by a fire that was ignited by a candle used during a religious

observance. The candle was burning on a stove and ignited cabinetry above it.¹⁰

- In February 1999, an unattended candle in a university dormitory room caused nearly \$25,000 in damage and sent two students to the hospital with smoke inhalation.¹¹

- A student was killed in December 2000 when a candle ignited her bedding.¹²

The Massachusetts State Fire Marshal has developed a program called "Candle Circle of Safety." Recommendations include:¹³

- Burn candles inside a 1-foot circle of safety, free of anything that can ignite.

- Extinguish candles after use.

- Keep candles out of the reach of children and pets.

- Use a sturdy metal, glass, or ceramic candleholder.

- Never leave a burning candle unattended.

For further information, contact your local fire department, the National Candle Association, or the U.S. Fire Administration.

To review the detailed methodology used in this analysis, click [METHODOLOGY](#)

Footnotes

- News and Information*, National Candle Association, 2000.
- National estimates are based on 1993–98 data from the National Fire Incident Reporting System and the National Fire Protection Association's annual survey, *Fire Loss in the United States*.
- Candle Industry Facts*, National Candle Association, 2000.
- Idem*.
- NFIRS 1998 casualty data.
- News and Information*, loc. cit.
- "Trendy Candles Linked To Rise in Deadly Fires," *Chicago Sun-Times*, July 16, 2000.
- Idem*.
- "Candle Starts Fire Fatal to 2 Children," *New York Daily News*, December 23, 2000.
- "Killer Blaze Shocks New York Jews: Grand Rabbi's Relatives Die in Fire Caused by a Holiday Candle," *The Ottawa Citizen*, June 11, 2000.
- Chicago Sun-Times*, loc. cit.
- "Danger: Playing With Fire," *Newsweek*, December 11, 2000.
- Prevent Candle Fires*, Office of the Massachusetts State Fire Marshal, February 2000.